MEMORANDUM

TO:

Mr. Terry Taylor

Anderson, Mulholland and Associates

DATE: April 15, 2013

RE:

FROM: R. Infante()

Data Validation

BMSMC, Building 5 Area, PR

SM04.00.06

FILE: JB29717(R)

JB30082(R) JB30345(R) JB30252(R)

Accutest Job Numbers: JB29717; JB29717r; JB30082; JB30082r; JB30252; JB30252r; JB30345;

JB30345r

SUMMARY

Full validation was performed on the data for ten (10) soil samples analyzed selected volatile organic compound by method SW846-8260B an selected alcohols (methanol and isopropylalcohol) by method SW846-8015C DAI. The samples were collected at the Building 5 Area, Humacao, PR site From February 23 to March 3, 2013 and submitted to Accutest Laboratories of Dayton. New Jersey that analyzed and reported the results under delivery groups (SDG): JB29717; JB29717r; JB30082; JB30082r; JB30252; JB30252r; JB30345; JB30345r.

The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "USEPA Region 2, SOP HW-24, Validating Volatile Organic Compounds by GC/MS, SW-846 Method 8260B (August 2009-Revision 2), the USEPA National Functional Guidelines for Low Concentration Organic Data Review (August 2009-Revision 2), the USEPA National Functional Guidelines for Organic Data Review for Low Concentration Water (SOP HW-13, August 2009-Revision 3); (noted herein as the "primary guidance documents"). Also, QC criteria from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update IV, December 1998)," are utilized. The guidelines were modified to accommodate the non-CLP methodology. The QC criteria and data validation actions listed on the data review worksheets are from the primary quidance document, unless otherwise noted.

In general the data are valid as reported and may be used for decision making purposes. The data results are acceptable for use; some of the results were qualified. Result Isopropyl alcohol in samples JB29717-1R; JB29717-2R; and JB29717-3R were rejected (R) due samples analyzed after the holding time limits. Result for acetone rejected (R), calibration check over method criteria. Results for methanol and isopropyl alcohol in the other samples were estimated (J) due to samples analyzed after holding time limits. Results for acetone estimated (J) in sample JB30345-1, calibration check over method criteria. Results for acetone estimated (J) in sample JB30252-1, MS/MSD outside control limits.

SAMPLES

The samples included in the review are listed below

FIELD SAMPLE ID	LABORATORY ID	DATE	ANALYSIS
AREAEC10_BOT	JB29717-1	02/23/13	VOCs
AREAEC11_BOT	JB29717-2	02/23/13	VOCs
AREAEC6_BOT	JB29717-3	02/25/13	VOCs
AREAEC10_BOT	JB29717-1R	02/23/13	ALCOHOLS

FIELD SAMPLE ID	LABORATORY ID	DATE	ANALYSIS
AREAEC11_BOT	JB29717-2R	02/23/13	ALCOHOLS
AREAEC6_BOT	JB29717-3R	02/25/13	ALCOHOLS
AREAEC_9BOT	JB30082-1	02/27/13	VOCs
AREAEC_12BOT	JB30082-2	02/27/13	VOCs
AREAEC_12BOT MSD	JB30082-2D	02/27/13	VOCs
AREAEC_12BOT MS	JB30082-2S	02/27/13	VOCs
AREAEC_13BOT	JB30082-3	02/28/13	VOCs
AREAEC_9BOT	JB30082-1R	02/27/13	ALCOHOLS
AREAEC_12BOT	JB30082-2R	02/27/13	ALCOHOLS
AREAEC_12BOT MSD	JB30082-2RD	02/27/13	ALCOHOLS
AREAEC_12BOT MS	JB30082-2RS	02/27/13	ALCOHOLS
AREAEC_13BOT	JB30082-3R	02/28/13	ALCOHOLS
AREAEC_14BOT	JB30252-1	03/01/13	VOCs
AREAEC_14BOT	JB30252-1R	03/01/13	ALCOHOLS
AREAEC_14BOT	JB30345-1	03/02/13	VOCs
AREAEC_14BOT	JB30345-1R	03/02/13	ALCOHOLS

REVIEW ELEMENTS

Sample data were reviewed for the following parameters, where applicable to the method

- o Agreement of analysis conducted with chain of custody (COC) form
- o Holding time and sample preservation
- Gas chromatography/mass spectrometry (GC/MS) tunes
- o Initial and continuing calibrations
- o Method blanks/trip blanks/field blank
- Surrogate spike recovery
- Matrix spike/matrix spike duplicate (MS/MSD) results
- o Internal standard performance
- o Field duplicate results
- o Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results
- o Quantitation limits and sample results

DISCUSSION

Agreement of Analysis Conducted with COC Request

Sample reports corresponded to the analytical request designated on the chain-of-custody form.

Holding Times and Sample Preservation

The cooler temperatures were within the QC acceptance criteria of $4^{\circ}C \pm 2^{\circ}C$.

Sample preservation was acceptable.

Samples analyzed within method recommended holding time except for the followings:

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pН	ACTION
JB29717-1R	02/23/13	03/20/13	-	1
JB29717-2R	02/23/13	03/20/13	-	
JB29717-3R	02/25/13	03/20/13	-	
JB30082-1R	02/27/13	03/20/13	-	2
JB30082-2R	02/28/13	03/20/13	-	
JB30082-3R	02/28/13	03/20/13	-	
JB30082-2RMSD	02/28/13	03/20/13	-	
JB30082-2RMS	02/28/13	03/20/13	-	`
JB30252-1R	03/01/13	03/20/13	-	
JB30345-1R	03/02/13	03/20/13	-	

- 1. The sample analyzed < 28 days after 7 days holding time expiration. Positive results estimated (J), nondetects are rejected (R).
- 2. The sample analyzed < 14 days after 7 days holding time expiration. Positive results and nondetecs are estimated (J).

GC/MS Tunes

The frequency and abundance of bromofluorobenzene (BFB) tunes were within the QC acceptance criteria. All samples were analyzed within the tuning criteria associated with the method.

Initial and Continuing Calibrations

VOCs

The percent relative standard deviations (%RSDs) and response factors (RFs) of all target analytes were within the QC acceptance criteria in the initial calibration. Correlation coefficients (r²) of target analytes were within the QC acceptance criteria. Ongoing accuracy of the instrument was determined by the analysis of a continuing calibration standard. Initial and continuing calibration meets method performance criteria except for the following:

- Continuing calibration % difference outside method control limits for acetone for the 02/08/13 calibration check; - 56.1 %. Results for acetone rejected (R) in sample JB30082-1.
- Continuing calibration % difference outside method control limits for acetone for the 03/12/13 calibration check; - 20.7 %. Results for acetone estimated in sample JB30345-1.

Alcohols

The percent relative standard deviations (%RSDs) and response factors (RFs) of all target analytes were within the QC acceptance criteria in the initial calibration and continuing calibration in at least one of the two signals.

Method Blank/Trip Blank/Field Blank

Target analytes were not detected in laboratory method blanks for VOCs and alcohols.

No field/trip/equipment blanks analyzed with this data package.

Surrogate Spike Recovery

The surrogate recoveries were within the laboratory QC acceptance limits in all samples analyzed.

MS/MSD

VOCs

Matrix spike was performed on samples JB30582-38MS/-38MSD; JB30041-2MS/-2MSD; JB30109-9MS/-9MSD; JB30082-2MS/-2MSD; JB30950-2MS/-2MSD; and JB30917-2MS/-2MSD. Recoveries for MS/MSD and RPD were within laboratory control limits except for the followings:

- Acetone recovery outside control limits in JB30041-2MS/-MSD; no action taken due to high sample concentration relative to amount spiked.
- Acetone recovery and RPD outside control limits in JB30181-14MS/-MSD; no action taken due to high sample concentration relative to amount spiked.
- MIBK MS/MSD RPD outside control limits in JB30181-14MS/-MSD; no action taken due to high sample concentration relative to amount spiked.
- Acetone recovery outside control limits in JB30109-9MS/-MSD; no action taken due to high sample concentration relative to amount spiked.
- Acetone recovery and RPD outside control limits in JB30082-2MS/-MSD; no action taken due matrix interferences.
- Acetone recovery outside control limits in JB30950-2MS/-MSD; results for acetone qualified as estimated in sample JB30252-1.

Alcohols

Matrix spike was performed on samples JB30082-2RMS/-2RMSD. Recoveries for MS/MSD were within laboratory control limits; RPD for MS/MSD were within control limits.

Internal Standard Performance

VOCs

Samples were spiked with the method specified internal standard. Internal standard performance met the QC acceptance criteria in all sample analyses.

Field Duplicate Results

Field duplicate not analyzed as part of this data set. Laboratory duplicates for VOC were samples JB30586-36/JB30586-36 DUP. RPD results were within laboratory/recommended control limits except for the followings:

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Toluene	0.12	ND	0.31	200	No action taken; low
					concentration of hit

No field/laboratory duplicates analyzed for alcohols.

When field/laboratory samples were not reported with the data package MS/MSD RPD was used to assess precision. RPD within laboratory and generally acceptable control limits.

LCS/LCSD Results

VOCs

The laboratory analyzed one LCS (blank spike) associated with each matrix from this data set. The % recoveries of all spiked analytes were within the laboratory QC acceptance limits.

Alcohols

The laboratory analyzed one LCS (blank spike) associated with each matrix from this data set. The % recoveries of all spiked analytes were within the laboratory QC acceptance limits.

Quantitation Limits and Sample Results

Dilutions were required with this data set.

tael Infanto

Méndez.

IC # 1888

Calculations were spot checked.

Certification

The following samples JB29717-1; JB29717-2; JB29717-3; JB29717-1R; JB29717-2R; JB29717-3R; JB30082-1; JB30082-2; JB30082-2D; JB30082-2S; JB30082-3; JB30082-1R; JB30082-2R; JB30082-2RD; JB30082-R2S; JB30082-3R; JB30252-1; JB30252-1R; JB30345-1; and JB30245-1R were analyzed following standard procedures accepted by regulatory agencies. The quality control requirements met the methods criteria except in the occasions described in this document. Some of the results were qualified. The results are valid except the alcohol results that were rejected.

Rafae // Infante

Chemist License 1888

Accutest LabLink@720494 09:54 25-Mar-2013

Report of Analysis

By

MS

Prep Date

02/26/13 14:00

Page 1 of 1

Client Sample ID: AREAEC10_BOT

Lab Sample ID: Matrix:

JB29717-1

SO - Soil

Date Sampled: 02/23/13 Date Received: 02/26/13

Method:

SW846 8260B SW846 5035

n/a

Percent Solids: 90.2

Project:

BMSMC, Building 5 Area, PR

Analyzed

03/07/13

DF

1

Prep Batch

Analytical Batch VX5796

Run #1 Run #2

Initial Weight

X133720.D

Run #1 Run #2 4.8 g

File ID

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	48.1	12	2.0	ug/kg	
71-43-2	Benzene	1.8	1.2	0.14	ug/kg	
100-41-4	Ethylbenzene	2.6	1.2	0.30	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	5.4	5.8	0.87	ug/kg	J
108-88-3	Toluene	0.27	1.2	0.12	ug/kg	J
1330-20-7	Xylene (total)	11.2	1.2	0.16	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
1868-53-7	Dibromofluoromethane	97%		70-1	30%	
17060-07-0	1,2-Dichloroethane-D4	86%		70-1	22%	
2037-26-5	Toluene-D8	97%		81-127%		
460-00-4	4-Bromofluorobenzene	96%		66-1	32%	



ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

3

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Accutest LabLink@720494 09:54 25-Mar-2013

Report of Analysis

By

ET

Run# 2

Page 1 of 1

Client Sample ID: AREAEC11_BOT

File ID

D206079.D

Lab Sample ID:

JB29717-2

Date Sampled: 02/23/13

Matrix: Method: SO - Soil SW846 8260B SW846 5035 Date Received: 02/26/13 Percent Solids: 89.1

Project:

BMSMC, Building 5 Area, PR

Prep Batch Analytical Batch

Run #1 a Run #2

02/26/13 14:00

Limits

Prep Date

n/a

VD8406

Run #1 4.5 g

Initial Weight Final Volume $5.0 \, ml$

DF

1

Methanol Aliquot 100 ul

Analyzed

03/04/13

Run #2

CAS No.

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	161	680	120	ug/kg	J
71-43-2	Benzene	ND	68	8.1	ug/kg	
100-41-4	Ethylbenzene	683	68	18	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	224	340	51	ug/kg	J
108-88-3	Toluene	ND	68	7.2	ug/kg	_
1330-20-7	Xvlene (total)	1710	68	9.5	11g/kg	

Run#1

1868-53-7	Dibromofluoromethane	90%	70-130%
17060-07-0	1,2-Dichloroethane-D4	90%	70-122%
2037-26-5	Toluene-D8	97%	81-127%
460-00-4	4-Bromofluorobenzene	92%	66-132%

(a) Diluted due to high concentration of target compound.

Surrogate Recoveries





MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

] = Indicates an estimated value

B = Indicates analyte found in associated method blank



Accutest LabLink@720494 09:54 25-Mar-2013

Report of Analysis

By

RS

Prep Date

02/26/13 14:00

Page 1 of 1

Analytical Batch

VY5667

Client Sample ID:	AREAEC6_BOT
I ah Sample ID:	IR20717_3

Matrix:

SO - Soil SW846 8260B SW846 5035 Date Sampled: 02/25/13

Date Received: 02/26/13

Method: Project:

BMSMC, Building 5 Area, PR

Percent Solids: 87.9

Prep Batch

n/a

File ID DF Analyzed

1

Run #1 Run #2

Initial Weight

Y131655.D

Run #1

5.0 g

Run #2

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1 71-43-2 100-41-4 108-10-1 108-88-3 1330-20-7	Acetone Benzene Ethylbenzene 4-Methyl-2-pentanone(MIBK) Toluene Xylene (total)	71.2 1.9 2.4 15.7 0.50 10.4	11 1.1 1.1 5.7 1.1	1.9 0.14 0.30 0.85 0.12 0.16	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg	J

03/05/13

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		70-130%
17060-07-0	1,2-Dichloroethane-D4	83%		70-122%
2037-26-5	Toluene-D8	109 %		81-127%
460-00-4	4-Bromoffuorobenzene	03%		66.13296



ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Report of Analysis

Page 1 of 1

Client Sample ID: AREAEC10_BOT Lab Sample ID: JB29717-1R

Matrix: Method: SO - Soil

SW846-8015C (DAI) Project:

Date Sampled: 02/23/13 Date Received: 02/26/13 Percent Solids: 90.2

BMSMC, Building 5 Area, PR

File ID DF Run #1 a GH92246.D 1

Analyzed 03/20/13

Prep Date n/a

Prep Batch n/a

Q

Analytical Batch GGH4267

Run #2

Initial Weight Run #1 5.0 g

Run #2

67-63-0

67-56-1

CAS No. Compound

ND

2 110 14100 J 220

RL

Run# 2

Ву

XPL

52 53

MDL

ug/kg ug/kg

Units

CAS No. Surrogate Recoveries

Methanol

Isopropyl Alcohol

91%

Run# 1

Result

58-133%

Limits

111-27-3 Hexanol 111-27-3 Hexanol

92%

58-1**33**%

(a) Sample analyzed outside the holding time per client's request.



ND = Not detected

MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

licates value exceeds calibration range



Report of Analysis

Page 1 of 1

Client Sample ID:	AREAEC11_BOT
Lab Sample ID:	JB29717-2R

Matrix: Method:

Project:

SO - Soil

SW846-8015C (DAI)

BMSMC, Building 5 Area, PR

Date Sampled: 02/23/13 Date Received: 02/26/13

Percent Solids: 89.1

Run #1 a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
	GH92247.D	1	03/20/13	XPL	n/a	n/a	GGH4267
Run #2							

	Initial Weight	
Run #1	5.0 g	
Run #2	•	

CAS No.	Compound	Result	RL	MDL	Units
67-63-0	Isopropyl Alcohol	ND R	110	52	ug/kg
67-56-1	Methanol	19700 J	220	54	ug/kg

CAS No. Surrogate Recoveries Run#1 Run# 2 Limits 111-27-3 Hexanol 89% 58-133% 111-27-3 Hexanol **72**% 58-133%

(a) Sample analyzed outside the holding time per client's request.



Q

Report of Analysis

Page 1 of 1

Client Sample ID:	AREAEC6_BOT		
Lab Sample ID:	JB29717-3R Date	Sampled:	02/25/13
Matrix:	SO - Soil Date	Received:	02/26/13
Method:	SW846-8015C (DAI) Perce	ent Solids:	87.9
Project.	DMSMC Duilding 5 Area DD		

Project: BMSMC, Building 5 Area, PR

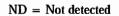
Run #1 a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
	GH92248.D	1	03/20/13	XPL	n/a	n/a	GGH4267
Run #2							

Run #1 Run #2	Initial Weight 5.0 g							
CAS No.	Compound	Result	RL	MDL	Units	Q		
67-63-0	Isopropyl Alcohol	ND A	110	53	ug/kg			

67-56-1	Methanol	18700 J	230	54 ug/kg
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	93%		58-133%
111-27-3	Hexanol	72%		58 -1 33 %

(a) Sample analyzed outside the holding time per client's request.





MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Accutest LabLink@719044 09:39 18-Mar-2013

Report of Analysis

Page 1 of 1

Client Sample ID: AREAEC_9BOT Lab Sample ID: JB30082-1

Matrix: Method:

Project:

SO - Soil

SW846 8260B SW846 5035

Date Sampled: 02/27/13 Date Received: 03/01/13

Percent Solids: 86.6

BMSMC, Building 5 Area, PR

File ID DF Prep Date Prep Batch Analytical Batch Analyzed Ву Run #1 A192404.D 1 03/08/13 OTR 03/01/13 12:00 n/a VA7246

Run #2

Initial Weight

5.1 g

Run #1 Run #2

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1 71-43-2 100-41-4 108-10-1 108-88-3 1330-20-7	Acetone Benzene Ethylbenzene 4-Methyl-2-pentanone(MIBK) Toluene Xylene (total)	ND & 2.8 33.0 ND 0.34 115	11 1.1 1.1 5.7 1.1	1.9 0.13 0.30 0.85 0.12 0.16	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	its	
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	102% 87% 109% 109%		70-1; 70-1; 81-1; 66-1;	22% 27%	



ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Accutest LabLink@719044 09:39 18-Mar-2013

Report of Analysis

Page 1 of 1

Client Sample ID:

AREAEC_12BOT JB30082-2

Lab Sample ID: Matrix:

SO - Soil

Date Sampled: Date Received:

02/28/13 03/01/13

Method:

SW846 8260B SW846 5035

DF

1

Percent Solids: 86.5

Project:

BMSMC, Building 5 Area, PR

Run #1

File ID A192477.D Analyzed 03/11/13

ND

ND

3.8

Run#1

110%

Prep Date By 03/01/13 12:00 OTR

Prep Batch n/a

Q

J

Analytical Batch VA7248

Run #2

Initial Weight

Run #1 Run #2

460-00-4

4.6 g

VOA Special List

CAS No. Compound Result

67-64-1 Acetone 189 71-43-2 Benzene 1.6 100-41-4 Ethylbenzene 1.0

4-Methyl-2-pentanone(MIBK) 108-10-1 108-88-3 **Toluene**

1330-20-7 Xylene (total) CAS No. Surrogate Recoveries

1868-53-7 Dibromofluoromethane 104% 17060-07-0 1,2-Dichloroethane-D4 90% 2037-26-5 Toluene-D8 108%

4-Bromofluorobenzene

1.3 0.131.3 0.17

RL

13

1.3

1.3

6.3

Run#2 Limits

MDL

2.1

0.15

0.33

0.94

Units

ug/kg

ug/kg

ug/kg

ug/kg

ug/kg

ug/kg

70-130% 70-122% 81-127%



ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Accutest LabLink@719044 09:39 18-Mar-2013

Report of Analysis

Ву

OTR

Prep Date

03/01/13 12:00

Analyzed

03/11/13

Page 1 of 1

Client Sample ID: AREAEC_13BOT

Lab Sample ID:

JB30082-3 SO - Soil

Date Sampled: Date Received: 03/01/13

n/a

02/28/13

Matrix: Method:

SW846 8260B SW846 5035

DF

1

Percent Solids: 75.8

Project:

BMSMC, Building 5 Area, PR

Prep Batch

Analytical Batch VA7248

Run #1 Run #2

Initial Weight

Run #1 Run #2

5.0 g

File ID

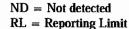
A192478.D

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	60.6	13	2.2	ug/kg	
71-43-2	Benzene	1.7	1.3	0.16	ug/kg	
100-41-4	Ethylbenzene	13.5	1.3	0.35	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	6.6	0.99	ug/kg	
108-88-3	Toluene	ND	1.3	0.14	ug/kg	
1330-20-7	Xylene (total)	54.3	1.3	0.18	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	its	

CAS No.	Surrogate Recoveries	Run#
1868-53-7	Dibromofluoromethane	104%
17060-07-0	1,2-Dichloroethane-D4	91%
2037-26-5	Toluene-D8	109%
460-00-4	4-Bromofluorobenzene	108%





MDL - Method Detection Limit

J = Indicates an estimated value

E = Indicates value exceeds calibration range

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Page 1 of 1

Matrix Spike/Matrix Spike Duplicate Summary

Job Number:

JB30082

Account:

AMANYWP Anderson, Mulholland & Associates

Project:

BMSMC, Building 5 Area, PR

Sample JB30082-2MS JB30082-2MSD JB30082-2	File ID A192474.D A192475.D A192477.D	DF 1 1	Analyzed 03/11/13 03/11/13 03/11/13	By OTR OTR OTR	Prep Date n/a n/a n/a	Prep Batch n/a n/a n/a	Analytical Batch VA7248 VA7248 VA7248
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The QC reported here applies to the following samples:

Method: SW846 8260B

JB30082-2, JB30082-3

CAS No.	Compound	JB30082 ug/kg	2-2 Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1 71-43-2 100-41-4 108-10-1 108-88-3 1330-20-7	Acetone Benzene Ethylbenzene 4-Methyl-2-pentanone(MIBK) Toluene Xylene (total)	189 1.6 1.0 ND ND ND 3.8	J	60.2 60.2 60.2 60.2 60.2 181	163 61.4 61.5 71.7 61.7 184	-43* a 99 100 119 102 100	102 60.6 60.7 65.8 61.5 181	-148* a 100 101 112 104 100	46* b 1 1 9 0 2	10-198/35 44-130/21 29-137/25 39-143/22 40-135/22 28-139/25
CAS No.	Surrogate Recoveries	MS		MSD	JB3	30082-2	Limits			
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	105% 88% 108% 101%		102% 83% 109% 99%	104 909 108 110	6 8%	70-1309 70-1229 81-1279 66-1329	6 6		

- (a) Outside control limits due to high level in sample relative to spike amount.
- (b) Outside control limits due to matrix interference.





^{* =} Outside of Control Limits.

Report of Analysis

Page 1 of 1

Client Sam Lab Samp! Matrix: Method: Project:	JB30082-1R SO - Soil SW846-8015C				Date	Received: 03	2/27/13 8/01/13 6.6
Run #1 ^a Run #2	File ID DF GH92241.D 1	Analyzed 03/20/13	By XPL	Prep Da	ate	Prep Batch n/a	Analytical Batch GGH4267
Run #1 Run #2	Initial Weight 5.0 g	-					-
CAS No.	Compound	Result	RL	MDL	Units	Q	
67-63-0 67-56-1	Isopropyl Alcohol Methanol ^b	ND J 560 J	120 230	54 55	ug/kg ug/kg		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its		
111-27-3 111-27-3	Hexanol Hexanol	93% 98%			33% 33%		

- (a) Sample analyzed outside the holding time per client's request.
- (b) More than 40 % RPD for detected concentrations between the two GC columns.





MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Report of Analysis

Page 1 of 1

Client Sample ID:	AREAEC_12BOT
Lab Sample ID: Matrix:	JB30082-2R
Matrix:	SO - Soil

Initial Weight

5.3 g

SW846-8015C (DAI)

Date Sampled: 02/28/13 Date Received: 03/01/13

Method: Project:

Run #1

BMSMC, Building 5 Area, PR

Percent Solids: 86.5

File ID DF Analyzed Prep Date Prep Batch Analytical Batch Ву Run #1 a GH92242.D 03/20/13 XPL GGH4267 1 n/a n/a Run #2

Run #2						
CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0 67-56-1	Isopropyl Alcohol Methanol	ND J	110 220	51 52	ug/kg ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run#	2 Lim	its	
111-27-3 111-27-3	Hexanol Hexanol	93% 70%			133% 133%	

(a) Sample analyzed outside the holding time per client's request.





MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Report of Analysis

Page 1 of 1

Client Sample ID:	AREAEC_13BOT
Lab Sample ID:	JB30082-3R

Matrix: SO - Soil Method:

SW846-8015C (DAI) BMSMC, Building 5 Area, PR Date Sampled: 02/28/13 Date Received: 03/01/13

Percent Solids: 75.8

	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
Run #1 a	GH92243.D	1	03/20/13	\mathbf{XPL}	n/a	n/a	GGH4267
Run #2							

	Initial Weight
Run #1	5.0 g
D "10	-

Run #2

Project:

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0 67-56-1	Isopropyl Alcohol Methanol ^b	ND J 1020 J	130 260	61 63	ug/kg ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
111-27-3	Hexanol	93%		58-1	.33%	
111-27-3	Hexanol	95%		58-1	.33%	

(a) Sample analyzed outside the holding time per client's request.

(b) More than 40 % RPD for detected concentrations between the two GC column (1990)





MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range



Page 1 of 1

Job Number: JB30082R

Account:

AMANYWP Anderson, Mulholland & Associates

Project: BMSMC, Building 5 Area, PR

The QC reported here applies to the following samples:

Method: SW846-8015C (DAI)

JB30082-1R, JB30082-2R, JB30082-3R

CAS No.	Compound	JB30082-2R ug/kg Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-63-0 67-56-1	Isopropyl Alcohol Methanol	ND 1	5450 5450	5570 5580	102 102	5620 5330	103 98	1 5	54-142/24 44-146/19
CAS No.	Surrogate Recoveries	MS	MSD	ЈВ3	0082-2R	Limits			
111-27-3 111-27-3	Hexanol Hexanol	94% 68%	93% 118%	93% 70%	_	58-133% 58-133%			

(a) Sample analyzed outside the holding time per client's request.





^{* =} Outside of Control Limits.

Accutest LabLink@719626 09:04 20-Mar-2013

Report of Analysis

Page 1 of 1

Client Sample ID: AREAD-14BOT

Lab Sample ID: Matrix:

JB30252-1

Method:

SO - Soil SW846 8260B SW846 5035

BMSMC, Building 5 Area, PR

03/01/13 Date Sampled: Date Received: 03/02/13

Percent Solids: 74.6

Project:

Run #1 Run #2 File ID Y131939.D DF Analyzed 03/13/13 1

By RS Prep Date 03/02/13 15:00

Prep Batch n/a

Analytical Batch VY5679

Initial Weight

Run #1 Run #2 5.4 g

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	42.9 J	12	2.1	ug/kg	
71-43-2	Benzene	0.80	1.2	0.15	ug/kg	J
100-41-4	Ethylbenzene	12.0	1.2	0.33	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	92.8	6.2	0.93	ug/kg	
108-88-3	Toluene	ND	1.2	0.13	ug/kg	
1330-20-7	Xylene (total)	46.0	1.2	0.17	ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	# 2 Limits		
1868-53-7	Dibromofluoromethane	99%		70-13	30%	
17060-07-0	1,2-Dichloroethane-D4	95%		70-12	22%	
2037-26-5	Toluene-D8	100%		81-12	27%	
460-00-4	4-Bromofluorobenzene	95%		66-13	32%	



ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



Report of Analysis

Page 1 of 1

Client Sample ID: **AREAD-14BOT**

Lab Sample ID:

JB30252-1R

Matrix: Method: Project:

SO - Soil SW846-8015C (DAI)

BMSMC, Building 5 Area, PR

Date Sampled: Date Received:

03/01/13 03/02/13

Percent Solids: 74.6

File ID DF Analyzed $\mathbf{B}\mathbf{y}$ Prep Date Prep Batch **Analytical Batch** Run #1 a GH92252.D 03/20/13 XPL n/a **GGH4267** 1 n/a

Run #2

Initial Weight

Run #1 5.2 g

Run #2

CAS No. RLCompound Result MDL Units Q

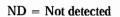
67-63-0 Isopropyl Alcohol ND7 130 60 ug/kg 67-56-1 Methanol 1670 J 260 61 ug/kg

CAS No. Surrogate Recoveries Run#1 Run#2 Limits

111-27-3 Hexanol 88% 58-133% 111-27-3 Hexanol **75%** 58-133%

(a) Sample analyzed outside the holding time per client's request.





MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Accutest LabLink@720494 09:59 25-Mar-2013

Report of Analysis

Page 1 of 1

Client Sample ID: AREAD-15 BOT

Lab Sample ID:

JB30345-1

Matrix:

SO - Soil

SW846 8260B SW846 5035

Date Sampled: 03/02/13 Date Received:

03/05/13

Method: Project:

BMSMC, Building 5 Area, PR

Percent Solids: 80.4

Run #1

File ID A192525.D DF 1

Analyzed

03/12/13

Ву OTR Prep Date 03/05/13 13:00

Prep Batch n/a

Analytical Batch

VA7250

Run #2

Initial Weight

Run #1 Run #2

5.3 g

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1 71-43-2 100-41-4 108-10-1 108-88-3 1330-20-7	Acetone Benzene Ethylbenzene 4-Methyl-2-pentanone(MIBK) Toluene Xylene (total)	66.1 J 0.78 3.3 42.9 ND 11.8	12 1.2 1.2 5.9 1.2 1.2	2.0 0.14 0.31 0.88 0.12 0.16	ug/kg ug/kg ug/kg ug/kg ug/kg ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1
1868-53-7	Dibromofluoromethane	103%
17060-07-0	1,2-Dichloroethane-D4	90%
2037-26-5	Toluene-D8	109%
460-00-4	4-Bromofluorobenzene	108%

Limits

Run# 2

70-130% 70-122%

81-127%

tael Infante Méndez (# 1888

ND = Not detected

MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank



111-27-3

111-27-3

Hexanol

Hexanol

Accutest LabLink@723561 11:15 08-Apr-2013

Report of Analysis

Page 1 of 1

Client Sample ID: AREAD-15 BOT Lab Sample ID: JB30345-1R Matrix: SO - Soil Method: SW846-8015C (DAI) Project: BMSMC, Building 5 Area, PR					Date Sampled: 03/02/13 Date Received: 03/05/13 Percent Solids: 80.4			
Run #1 ^a Run #2	File ID D GH92251.D 1	03/20/13	By XPL	Prep D n/a	ate	Prep Batch n/a	Analytical Batch GGH4267	
Run #1 Run #2	Initial Weight 5.3 g				_			
CAS No.	Compound	Result	RL	MDL	Units	Q		
67-63-0 67-56-1	Isopropyl Alcohol Methanol	ND 7 ND 7		55 56	ug/kg ug/kg			
CAS No.	Surrogate Recove	ries Run#1	Run#	2 Lim	its			

(a) Sample analyzed outside the holding time per client's request.

93%

71%



58-133%

58-133%



MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank





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JB29717R: Chain of Custody Page 1 of 4



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JB30082R: Chain of Custody Page 1 of 3



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Client / Reporting Information			Project	Informa	tion						i ch	33	100	Req	ueste	d Anal	ysis (s	see Te	STCC	DDE sh	eet)		Matrix Codes
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White Plains NY 101004 Propa Contract	City Project#		Stale	Bitting to Company Street Ad		on (if did	erent t	rom R	eport I	to)			7										SO - Soil St Sludge SED-Sedknent OI - Oil LIQ - Other Usuid
Phone Aylon, Thylor	Cient Purchase	msulf	Com	City				State			Ζiρ	\dashv	Local										AIR - Air SOL - Other Scal WP - Wape FB-Field Blank
914-251-0400 Sample(s) Name(s) Phone # NLS day M Rivers	Project Manager			Attention	:				_				5	- Ø									EB-Equipment Blank RB-Rinse Blank TB-Trip Blank
Accument Sample # Field ID / Point of Collection	MEOH/DI Visi #	Dece	Collection	Sampled by	Matrix	s of bottle	. Ÿ		L	N Water	MECH ENCORE		Bull										LAB USE ONLY
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Std. 16 Business Days Std. 10 Business Days (by Contract only) 18 Day RUSH 5 Day RUSH 5 Day Business Days (by Contract only) 19 Day EMERGENCY	Approved By (Acts)	dest PMJ: / Date:			Commen Commen FULLT1 NJ Redu Commen	cial "B" (Level 3 ced cial "C"	(Level	2)		X1 X2 B1 D1	YASP (YASP (tate Fo DD Fo ther	Catego rms	-			3	Enr	OR.	es	D.C			3/2/13
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JB30252: Chain of Custody Page 1 of 3



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通過	Client / Reporting Information			Project	informa	tion	ZS P	Y						Reg	uestec	1 Ana	lysis (see T	EST C	ODE	sheet)		Matrix Codes			
Сопрапу		Project Name:	- Buildin									P. W. C.	Ž,										DW - Drinking Water GW - Ground Water WW - Water			
110	Corporate Park Dr.	Sueer		•	Billing I	nformatic	n (if diffe	(FEE)335	SALVIDES.	ort u	(3)3988 9)	19. Table	7										SW - Surface Water SO - Soit			
Wh	ite Plains, NY 10004	Hu Ma	cao	PR	Compan Street Ac								_ <u>z</u>										St Studge SED-Sediment OI - Oil LIQ - Other Liquid			
Teri	mace 14 Taylor Haylor Banducous	¥cM				xress							1 %							}			AIR - Air SOL - Other Soud			
Phone #	ry Taylor theylor Panisiconshi 14-251-0400	Client Purchase			City			S	tate		Z	Ϊφ	S S	فرگ									WP - Wipe F8-Field Stank E8-Equipment Blank			
Sampler(s	estor M. Rivera Phone*	Project Manager	,		Attention	r							_ 46 60 100 100 100 100 100 100 100 100 100	Sol									RB- Rinse Blank TB-Trip Blank			
Accumus Sample 9	Field ID / Point of Collection	MECHADI VINI #	Deta	Collection	Sampled by	Metrix	S of ballies		Number	Ť	ž .	ENCORE SER	Building	<i>'</i> ,'				!					LAB USE ONLY			
-/	AREAD-15 BOT		3/2/13	1215	MM		4-		П	7	打	v	8	مرز												
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# Page 1	Turnaround Time (Business days)	201000000000000000000000000000000000000			energy		026	Dolor	erable I)	Ш.	1988	-	100000000000000000000000000000000000000	F35-67	SREETS	Con	monte	I Snari	al lactour	tione 383				
Ξ	Stri. 15 Business Days	Approved By (Acco		and the second			3) "A" (E	evel 1	1)			ASP Cat	agory A	ereseage		,		9 5011	Мак	, орси	ai bistiat	our Edi	ULL CONTROL OF CONTROL			
7 5	Std. 10 Business Days (by Contract only)						ial "B" (l Level 3+		3			ASP Cad te Form	egory B s		، ز	eace	75 75	11								
	5 Day RUSH					NJ Reduc	æd	•			<u></u>) Form		_			4-7	· ·								
	3 Day EMERGENCY 2 Day EMERGENCY					Commerc	Commen	cial "A"	= Resu	Es On	_	er														
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11	9																									

JB30345R: Chain of Custody Page 1 of 4



		Number:JB29717
	Date:	02/23_+_25/2013
REVIEW OF VOLATILE ORGA The following guidelines for evaluating volatile organics w	ere create	ed to delineate required validation
actions. This document will assist the reviewer in using prodecision and in better serving the needs of the data users. The USEPA data validation guidance documents in the following of the control of t	ne sample order of pr	results were assessed according to recedence: USEPA Region 2, SOP
HW-24, Standard Operating Procedure for the Validation of 0 8260B (August, 2009-Revision 2), the USEPA National Concentration Organic Data Review (SOW SOM01.2 SOP HV	al Functio <i>N</i> -33, Aug	onal Guidelines for Low/Medium ust 2009 – Revision 2), the USEPA
National Functional Guidelines for Organic Data Review for Lo 2009-Revision 3). Also, QC criteria from "Test Methods fo Methods SW-846 (Final Update III, December 1996)," specific QC criteria and data validation actions listed on the data review	r Evaluatir ally for Me	ng Solid Waste, Physical/Chemical thods 8000/8260B are utilized. The
document, unless otherwise noted.	SW WOINSII	icets are north the primary guidance
The hardcopied (laboratory name) _Accutest	arized. The	data package received has been adata review for VOCs included:
Lab. Project/SDG No.:JB29717 No. of Samples:3	Samp	le matrix:Soil
Trip blank No.:		
Field blank No.:		
Equipment blank No.: Field duplicate No.: -		
i leiù daplicate No		-
X Data Completeness	Χ	_ Laboratory Control Spikes
X Holding Times	X	
X GC/MS Tuning		_ Calibrations
X Internal Standard Performance		_ Compound Identifications
X Blanks		Compound Quantitation
X Surrogate Recoveries	X	_ Quantitation Limits
X Matrix Spike/Matrix Spike Duplicate		
Overall Comments:_Selected_VOC's_by_SW846-8260B		
Definition of Qualifiers:		
J- Estimated results		
U- Compound not detected		
R- Rejected data		
UJ- Estimated normeteet		
Reviewer: Lafay Onfun		
Date:04/14/201(3		

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED
		_

All criteria were metX_	
Criteria were not met	
and/or see below	

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pН	ACTION
	-			
	Sample analyzed w	ithin method recommen	ded hold	ing time
	Campic analyzed w	idili i i i i i i i i i i i i i i i i i	aca nota	ing time.

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH \leq 2, 4°C), no air bubbles.

Aqueous samples -7 days from sample collection for unpreserved samples, 4° C, no air bubbles.

Soil samples- 7 days from sample collection.

Cooler temperature (Criteria: 4 ± 2 °C): 4°C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).

If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)

If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).

If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).

If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).

If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).

If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were metX
Criteria were not met see below

GC/MS THNING

GONNO TONING			
The assessment of standard tuning Q	•	determine if the sample instrumen	tation is within the
XThe BFB p	performance results were	reviewed and found to be within the	specified criteria.
XBFB tunin	g was performed for every	y 12 hours of sample analysis.	
lf no, use profess qualified or rejecte		nine whether the associated data sl	nould be accepted,
List	the	samples	affected:
If mass calibration	is in error all associated	data are rejected	

it mass calibration is in error, all associated data are rejected.

All criteria were metX
Criteria were not met
and/or see below

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:	02/11/13_	_03/06/13_	_01/07/13
Dates of continuing calibration:	03/04/13_	_03/07/13_	03/05/13
Instrument ID numbers:	GCMSD_	_GCMSX_	_GCMSY
Matrix/Level:Aqueous/low			

DATE	LAB ID#	FILE	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
			-		
	Initial and continuing calibration meet method specific criteria				
		·			

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.

All %RSD must be < 15 % regardless of method requirements for CCC.

All %Ds must be ≤ 20% regardless of method requirements for CCC.

It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of \geq 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.

If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.

If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).

If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were metN/A
Criteria were not met
and/or see below

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_field/equip	ment/trip_blank	s_analyzed_wi	th_this_data_package	
				-

All criteria were metN/A
Criteria were not met
and/or see below

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)

ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and \le AL, report the compound as not detected (U) at the SQL.

If the concentration is \geq SQL but \leq AL, report the compound as not detected (U) at the reported concentration.

If the concentration is \geq SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately

Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES
	_				
	<u> </u>				

All criteria were metX
Criteria were not met
and/or see below

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery. Matrix: solid/aqueous

SAMPLE ID		SURROGA		ACTION	
	1,2-DCA	DBFM	TOL-d8	BFB	
_All_surrogate_red	overies_within	_laboratory_coi	ntrol_limits		_
				_	
				_	
				_	
_					_
QC Limits* (Aqueo	•				
LL_to_UL_		to	to	to	
QC Limits* (Solid-I	₋ow)				
LL_to_UL_	to_	to	to	to	_
QC Limits* (Solid-I	Med)				
LL_to_UL_	to_	to	to	to	_
1,2-DCA = 1,2-Dic	hloromethane-	d4	TOL-d8	s = Toluene-d8	
DBFM = Dibromoff	uoromethane		BFB = 1	Bromofluorobenz	ene
		u i			ene

- QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 80 120 % for aqueous and 70 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%. If anyone surrogate in a fraction shows < 10 % recovery.

All criteria were metX
Criteria were not met
and/or see below

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

_	30582-38MS/-38MSD ₋ 30041-2MS/-2MSD				evel:Soil evel:Soil	
MS OR MSD JB30041-2MS/-2	COMPOUND MSD	% R	RPD	QC LIMITS	ACTION	
_MS	Acetone	4		10198	No_action	
		9				
JB30181-14MS/-	·14MSD					
MSD	Acetone	218	43	10198/35	No_action	
_MS/MSD	MIBK		34	22	No_action	

Note: JB30041-2MS/2MSD – no action due to high sample concentration relative to amount spiked.

JB30181-14MS/14MSD – no action due to high sample concentration

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were metX
Criteria were not met
and/or see below

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD - Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:			Matrix/Le	vel/Unit:	
COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

^{*} If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).

^{*} If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met _	_X
Criteria were not met	
and/or see below	

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

	LCS ID	COMPOUND	% R	QC LIMIT		
Recoveries_within_laboratory_control_limits						

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).

If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? <u>Yes</u> or No. If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

		All criteria were n Criteria were not and/or see below	met
IX.	FIELD DUPLICATE PRECISION		
	Sample IDs:	Matrix:	-

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information. Suggested criteria: RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field duplicate analyzed with this data package. Laboratory duplicate used to assess precision					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

		All criteria were metX Criteria were not met and/or see below
IX.	FIELD DUPLICATE PRECISION	
	Sample IDs: _JB30586-36/-36DUP	Matrix:Soil

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information. Suggested criteria: RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Toluene	0.12	ND	0.31	200	No action; low concentration of hit

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were metX
Criteria were not met
and/or see below

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

- * Area of +100% or -50% of the IS area in the associated calibration standard.
- * Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION
_Internal_sta	andard_area_within	_laboratory_cor			
		-			
Actions:					

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 %	IS AREA > + 100%
		TO - 50%	
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met _X
Criteria were not met
and/or see below

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JB29717-2

MIBK RF = 0.156

[] = (3127)(50)/(307415)(0.156)

= 3.26 ppb OK

All criteria were metX
Criteria were not met
and/or see below

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

B.	Percent Solids
	List samples which have ≤ 50 % solids
Actions	:

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R) $\,$

	Project Number:JB29717
	Date:02/23-25/2013
REVIEW OF VOLATILE ORGA	
The following guidelines for evaluating volatile organics w	•
actions. This document will assist the reviewer in using producing and in better convince the peads of the data years. The	
decision and in better serving the needs of the data users. The LISERA data validation guideness desuments in the following	
USEPA data validation guidance documents in the following a HW-24, Standard Operating Procedure for the Validation of C	
8260B (August, 2009-Revision 2), the USEPA National	
Concentration Organic Data Review (SOW SOM01.2 SOP H	
National Functional Guidelines for Organic Data Review for Lo	
2009-Revision 3). Also, QC criteria from "Test Methods for	
Methods SW-846 (Final Update III, December 1996)," specific	
QC criteria and data validation actions listed on the data review	
document, unless otherwise noted.	, , ,
The hardcopied (laboratory name) _Accutest	data package received has been
reviewed and the quality control and performance data summa	arized. The data review for VOCs included:
Lab. Project/SDG No.:JB29717	Sample matrix:Soil
No. of Samples:3	_
T: 11 1 N	
Trip blank No.:	
Field blank No.:	
Equipment blank No.:	
Field duplicate No.:	
X Data Completeness	X Laboratory Control Spikes
X Bata completenessX Holding Times	X Field Duplicates
•	X Calibrations
N/A_ GC/MS TuningN/A_ Internal Standard Performance	
X Blanks	X Compound Identifications
	X Compound Quantitation
X Surrogate Recoveries	X Quantitation Limits
X Matrix Spike/Matrix Spike Duplicate	
Overall Comments:_Selected_alcohols_(methanol_and_i	isopropyl alcohol) by SW846-8015C
_(DAI)	isopropyi_aicoriorj_by_5vvo+0-0015C_
(D/11)	
Definition of Qualifiers:	
J- Estimated results	
U- Compound not detected	
R- Rejected daţa	
UJ- Estimated Mondaile oft // //	
Reviewer: Kayan Xylun	
Date:04/14/2013	

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED
		

All criteria were metX_	
Criteria were not met	
and/or see below	

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pН	ACTION
JB29717-1R	02/23/13	03/20/13	-	Estimate positive results
JB29717-2R	02/23/13	03/20/13	-	(J) and reject nondetects
JB29717-3R	02/25/13	03/20/13	-	(R)

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH \leq 2, 4°C), no air bubbles.

Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles. Soil samples- 7 days from sample collection.

Cooler temperature (Criteria: 4 + 2 °C): 4°C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).

If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)

If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).

If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).

If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).

If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).

If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were metN/A	
Criteria were not met see below	

GC	///	2	TI	IN	Ш	N	2
(3()	Iν	הו	- 1 (ш	MI.	ľ	١,٦

List	the	samples	affected:
If no, use profession qualified or rejected	, •	mine whether the associated data s	should be accepted,
N/A_ BFB tuning	was performed for eve	ry 12 hours of sample analysis.	
N/A_ The BFB pe	erformance results were	e reviewed and found to be within the	e specified criteria.
The assessment of standard tuning QC	•	to determine if the sample instrume	ntation is within the

If mass calibration is in error, all associated data are rejected.

All criteria were metX
Criteria were not met
and/or see below

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:	09/24/12
Dates of continuing calibration:_	03/20/13
Instrument ID numbers:	GCGH
Matrix/Level:Aqueous/mediur	n

DATE	LAB ID#	FILE	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and	continu	uing cali	bration meets method s signa	pecific requirements in at los.	east one of the two

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.

All %RSD must be < 15 % regardless of method requirements for CCC.

All %Ds must be ≤ 20% regardless of method requirements for CCC.

It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of \geq 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.

If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.

If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).

If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were metN/A
Criteria were not met
and/or see below

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
			fic_criteria	
Field <u>/</u> Equipmen				
DATE ANALYZED	LAB ID	LEVEL! MATRIX	COMPOUND	CONCENTRATION UNITS
_No_field/trip/ed	quipment_blank	s_analyzed_wi	th_this_data_package	

All criteria were metN/A
Criteria were not met
and/or see below

VB. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)

ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and \le AL, report the compound as not detected (U) at the SQL.

If the concentration is \geq SQL but \leq AL, report the compound as not detected (U) at the reported concentration.

If the concentration is \geq SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES
				l 	
		<u> </u>			
	_				

All criteria were metX
Criteria were not met
and/or see below

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.

Matrix: solid/aqueous

SAMPLE ID			SURROGATE C	ACTIO	ACTION	
Hexanol						
All	surrogate_recoveries	_and_rete	ention_times_withi	in_laboratory_conf	rol_limits	
	.imits* (Aqueous)			_		
	LL_to_UL	to	to	to	to	
QC L	_imits* (Solid-Low) LL_to_UL	to	to	to	to	
OCI	tr_to_Ut _imits* (Solid-Med)	เ0				
	LL_to_UL	to	to	to	to	
•	DCA = 1,2-Dichlorome M = Dibromofluorome			TOL-d8 = Tol BFB = Bromo	uene-d8 fluorobenzene	
*					er limit, UL = upper li jueous and 70 - 130	
Actio	ons:					
[QUALITY	9/	6R < 10%	%R = 10% - LL	%R > UL	
	Positive results	J		J	J	

Surrogate action should be applied:

Nondetects results

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.

UJ

Accept

If any one surrogate in a fraction shows < 10 % recovery.

R

All criteria were metX
Criteria were not met
and/or see below

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:JB300832-2RMS/-2RMSD		Matrix/Level:Soil			_	
MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION	
MS/MSD_recov	eries_and_RPD_wit	thin_labor	atory_co	ntrol_limits		
			,_	_		

- QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met _X
Criteria were not met
and/or see below

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD - Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:			Matrix/Level/Unit:			
COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION	
			-	_		

Actions:

^{*} If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).

^{*} If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were metX
Criteria were not met
and/or see below

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

	LCS ID	COMPOUND		% R	QC LIMIT			
Recoverie	Recoveries_within_laboratory_control_limits							

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).

If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? <u>Yes</u> or No. If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

		All criteria were metX Criteria were not met and/or see below
IX.	FIELD DUPLICATE PRECISION	
	Sample IDs:	Matrix:Soil

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information. Suggested criteria: RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
			for this data package. M		
p	recision.	RPD within laborat	ory and generally accep	table con	trol limits

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were metN/A
Criteria were not met
and/or see below

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

- * Area of +100% or -50% of the IS area in the associated calibration standard.
- * Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE AC RANGE	TION
		_			_

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%		IS AREA > + 100%	
		TO – 50%		
Positive results	J	J	J	
Nondetected results	R	UJ	ACCEPT	

If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were metX
Criteria were not met
and/or see below

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JB29717-1R

Methanol

RF = 14.32

[] = (182078)/(14.32)

= 12714 ppb OK

All criteria were met _X
Criteria were not met
and/or see below

XII.	Ql	Jan'	TIT/	\TIO	N	Limi	TS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

B.	Percent Solids
	List samples which have ≤ 50 % solids

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R) $\,$

	Project Number:JB30082	
	Date:02/27_+_28/2013	
REVIEW OF VOLATILE ORGATINE The following guidelines for evaluating volatile organics was actions. This document will assist the reviewer in using prodecision and in better serving the needs of the data users. The USEPA data validation guidance documents in the following of HW-24, Standard Operating Procedure for the Validation of C8260B (August, 2009-Revision 2), the USEPA National Concentration Organic Data Review (SOW SOM01.2 SOP HV National Functional Guidelines for Organic Data Review for Lo2009-Revision 3). Also, QC criteria from "Test Methods for Methods SW-846 (Final Update III, December 1996)," specific QC criteria and data validation actions listed on the data review document, unless otherwise noted. The hardcopied (laboratory name) _Accutestreviewed and the quality control and performance data summare.	vere created to delineate required value of the sample results were assessed accordance or forecedence: USEPA Region 2 Organic Data Acquired using SW-846 Mal Functional Guidelines for Low/MW-33, August 2009 – Revision 2), the Low Concentration Water (SOP HW-13, American Evaluating Solid Waste, Physical/Cheally for Methods 8000/8260B are utilized the worksheets are from the primary guidence.	formed ding to 2, SOP Method Medium JSEPA August, nemical d. The uidance
Lab. Project/SDG No.:JB30082 No. of Samples:5	Sample matrix:Soil	
Trip blank No.: Field blank No.: Equipment blank No.: Field duplicate No.:		
X Data CompletenessX Holding TimesX GC/MS TuningX Internal Standard PerformanceX BlanksX Surrogate RecoveriesX Matrix Spike/Matrix Spike Duplicate Overall Comments:_Selected_VOC's_by_SW846-8260B	X Laboratory Control SpikesX Field DuplicatesX CalibrationsX Compound IdentificationsX Compound QuantitationX Quantitation Limits	
Definition of Qualifiers: J- Estimated results U- Compound not detected R- Rejected data UJ- Estimated nondetect Reviewer: AM AM AMARIAN		

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were metX
Criteria were not met
and/or see below

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pН	ACTION
			<u> </u>	
	Sample analyzed w	thin method recommer	nded holdi	ng time.

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH \leq 2, 4°C), no air bubbles.

Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles. Soil samples- 7 days from sample collection.

Cooler temperature (Criteria: 4 + 2 °C): 4°C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).

If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)

If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).

If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).

If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).

If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).

If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

		Criteria	All criteria were metX were not met see below
GC/MS TUNING			
The assessment standard tuning Q	_	determine if the sample instrume	entation is within the
_X The BFB	performance results were	reviewed and found to be within the	e specified criteria.
XBFB tunin	g was performed for every	12 hours of sample analysis.	
If no, use profess qualified or rejecte		ine whether the associated data	should be accepted,
List	the	samples	affected:
If mass calibration	is in error, all associated	data are rejected.	

All criteria were metX
Criteria were not met
and/or see below

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:	02/20/13
Dates of continuing calibration:	03/08/1303/11/13
Instrument ID numbers:	GCMSA
Matrix/Level:Aqueous/low	

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, <u>%D</u> , r	COMPOUND	SAMPLES AFFECTED		
02/08/13	cc-7222-20	-56.1	Acetone	JB30082-1		
Results for	Results for Acetone rejected (R)					

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.

All %RSD must be < 15 % regardless of method requirements for CCC.

All %Ds must be \leq 20% regardless of method requirements for CCC.

It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of > 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.

If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.

If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).

If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were metN/A_	_
Criteria were not met	
and/or see below	

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE Analyzed	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
		method_specific	c_criteria	
Field <u>/</u> Equipmer	nt/Trip blank			
DATE Analyzed	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_field/equip	oment/trip_blank	s_analyzed_wi		

All criteria were met _	_N/A
Criteria were not met	
and/or see below	

VB. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)

ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and \le AL, report the compound as not detected (U) at the SQL.

If the concentration is \geq SQL but \leq AL, report the compound as not detected (U) at the reported concentration.

If the concentration is \geq SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately

Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES
		+		' 	
					

All criteria were metX
Criteria were not met
and/or see below

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery. Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND				ACTION
,	1,2-DCA	DBFM	TOL-d8	BFB	
_All_surrogate_reco	veries_within	n_laboratory_co	ntrol_limits		
					
					_
QC Limits* (Aqueou					
LL_to_UL		to_	to	to	<u></u>
QC Limits* (Solid-Lo	ow)				
LL_to_UL	to_	to_	to	to	
QC Limits* (Solid-Me	ed)				
LL_to_UL	•	to_	to	to	
1,2-DCA = 1,2-Dichl	loromethane.	-d4	TOI -	d8 = Toluene-d8	ł
DBFM = Dibromoflu		-u-T		: Bromofluorobe	
טווטווטווטווטום – וארוטט	Oromeurane		DFD -	- בייטוויטוועטוטוטו	SHZCHC

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 80 120 % for aqueous and 70 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%. If anyone surrogate in a fraction shows < 10 % recovery.

All criteria were metX
Criteria were not met
and/or see below

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:JB30109-9N Sample ID:JB30082-2N		Matrix/Level:Soil Matrix/Level:Soil		
	POUND % R	RPD	QC LIMITS	ACTION
JB30109-9MS/-9MSD				
_MSAcete	one8		10198	No_action
_MSD	1			
JB30082-2MS/-2MSD				
MSAcet	one43	46	10198/35	No_action
_MSD	-148			

Note: JB30082-2MS/-2MSD - no action due to high sample concentration relative to amount spiked.

JB30109-9MS/9MSD - no action due to matrix interferences

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were metX
Criteria were not met
and/or see below

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD - Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:		Matrix/Level/Unit:			
COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

^{*} If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).

^{*} If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were metX
Criteria were not met
and/or see below

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

	LCS ID	COMPOUND	% R	QC LIMIT			
Recoverie	Recoveries_within_laboratory_control_limits						
				_			

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).

If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? <u>Yes</u> or No. If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

		All criteria were metN/A Criteria were not met and/or see below
IX.	FIELD DUPLICATE PRECISION	
	Sample IDs:	Matrix:

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information. Suggested criteria: RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field/laboratory duplicate analyzed with this data package. Laboratory duplicate used to assess					
precision					
			precision		
			precision		

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were metX
Criteria were not met
and/or see below

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

- * Area of +100% or -50% of the IS area in the associated calibration standard.
- * Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION
_Internal_s	tandard_area_within	_laboratory_cor	ntrol_limits		
					-
					
					· · · · · · · · · · · · · · · · · · ·
Actions:					

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 %	IS AREA > + 100%
		TO - 50%	
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were metX
Criteria were not met
and/or see below

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JB30082-1

Ethylbenzene

RF = 1.309

[] = (213134)(50)/(278855)(1.309)

= 29.2 ppb OK

All criteria were metX
Criteria were not met
and/or see below

XII.	$\triangle I I \triangle$	NTITA	NOIT/	LIMITS
ΛII.	WUN	14 <i> </i>	YIIOIY	

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

В.	Percent Solids		
	List samples which have	≤ 50 % solids	
Actions		amala ia 10 509/ antimata nasitiw	a regulta (I) and nandatasta (I I I)
	ii the % solids of a soli sa	ample is 10-50%, estimate positive	e results (J) and nondetects (UJ)
	If the % solids of a soil sa (R)	ample is < 10%, estimate positive	results (J) and reject nondetects

	Project Number:JB30082r
	Date:02/27_+28/2013
REVIEW OF VOLATILE ORGA The following guidelines for evaluating volatile organics we actions. This document will assist the reviewer in using prodecision and in better serving the needs of the data users. The USEPA data validation guidance documents in the following of HW-24, Standard Operating Procedure for the Validation of C8260B (August, 2009-Revision 2), the USEPA National Concentration Organic Data Review (SOW SOM01.2 SOP HW National Functional Guidelines for Organic Data Review for Low 2009-Revision 3). Also, QC criteria from "Test Methods for Methods SW-846 (Final Update III, December 1996)," specificated QC criteria and data validation actions listed on the data review document, unless otherwise noted. The hardcopied (laboratory name) _Accutest	ere created to delineate required validation fessional judgment to make more informed a sample results were assessed according to order of precedence: USEPA Region 2, SOP organic Data Acquired using SW-846 Method I Functional Guidelines for Low/Medium W-33, August 2009 – Revision 2), the USEPA or Concentration Water (SOP HW-13, August, Evaluating Solid Waste, Physical/Chemical ally for Methods 8000/8015C are utilized. The worksheets are from the primary guidance
Lab. Project/SDG No.:JB30082 No. of Samples:5	
Trip blank No.:	
Field blank No.:	
Equipment blank No.:	
Field duplicate No.:	
X Data Completeness	X Laboratory Control Spikes
X Holding Times	X Field Duplicates
N/A_ GC/MS Tuning	X Calibrations
N/A_ Internal Standard Performance	X Compound Identifications
X Blanks	X Compound Quantitation
X Surrogate Recoveries	X Quantitation Limits
X Matrix Spike/Matrix Spike Duplicate	
Overall Comments:_Selected_alcohols_(methanol_and_is_(DAI)	sopropyl_alcohol)_by_SW846-8015C_
Definition of Qualifiers:	
J- Estimated results	
U- Compound not detected	
R- Rejected data	
UJ- Estimated prondetect / //	
- Kalley Xalas T	
Reviewer: 1 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	
Date:04/14/2013	

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were metX
Criteria were not met
and/or see below

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pН	ACTION
JB30082-1R	02/27/13	03/20/13	-	Estimate positive results
JB30082-2R	02/28/13	03/20/13	-	(J) and nondetects (J)
JB30082-3R	02/28/13	03/20/13	-	
JB30082-2RMSD	02/28/13	03/20/13	-	
JB30082-2RMS	02/28/13	03/20/13	-	

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH \leq 2, 4°C), no air bubbles.

Aqueous samples -7 days from sample collection for unpreserved samples, 4° C, no air bubbles. Soil samples -7 days from sample collection.

Cooler temperature (Criteria: 4 + 2 °C): 4°C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).

If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)

If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).

If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).

If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).

If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).

If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were metN/A
Criteria were not met see below

List	the	samples	affected
If no, use professional jud- qualified or rejected.	gment to determine whether	the associated data should be	accepted,
N/A_ BFB tuning was pe	rformed for every 12 hours of	f sample analysis.	
N/A_ The BFB performan	nce results were reviewed an	d found to be within the specified	criteria.
The assessment of the tur standard tuning QC limits	ning results is to determine	if the sample instrumentation is	within the
GC/MS TUNING			

If mass calibration is in error, all associated data are rejected.

All criteria were met _X
Criteria were not met
and/or see below

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:	_09/24/12
Dates of continuing calibration:_	_03/20/13
Instrument ID numbers:	GCGH
Matrix/Level:Aqueous/mediur	n

DATE	LAB ID#	FILE	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and	continu	uing cali	bration meets method sp signal	•	n at least one of the two

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.

All %RSD must be < 15 % regardless of method requirements for CCC.

All %Ds must be < 20% regardless of method requirements for CCC.

It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of \geq 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.

If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.

If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).

If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were metN/A
Criteria were not met
and/or see below

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
All_method				
Field <u>/</u> Equipmen				
DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_field/trip/e	quipment_blank	s_analyzed_wi	th_this_data_package	
			-	

All criteria were metN/A
Criteria were not met
and/or see below

VB. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)

ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and \le AL, report the compound as not detected (U) at the SQL.

If the concentration is \geq SQL but \leq AL, report the compound as not detected (U) at the reported concentration.

If the concentration is \geq SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately

Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES
					<u></u>
			<u> </u>		
				_	
	·				

All criteria were met _X
Criteria were not met
and/or see below

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery. Matrix: solid/aqueous

SAMPLE ID	5	SURROGATE	COMPOUND		ACTION
Hexa	nol				
_All_surrogate_recoveries	_and_retent	tion_times_witl	nin_laboratory_d	ontrol_limits	
QC Limits* (Aqueous)					
LL_to_UL	to	to	to	to	
QC Limits* (Solid-Low)LL_to_UL QC Limits* (Solid-Med)	to	to	to	to	
LL_to_UL	to	to	to	to	
1,2-DCA = 1,2-Dichlorome DBFM = Dibromofluorome				Toluene-d8 mofluorobenzene	e

- QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- If QC limits are not available, use limits of 80 120 % for agueous and 70 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.

If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met	_X
Criteria were not met	
and/or see below	

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:JB300832-2RMS/-2RMSD			Matrix/Level:Soil			
MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION	
MS/MSD_reco	veries_and_RPD_wi	thin_labor	atory_co	ntrol_limits		
		_	,	_		

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were metX
Criteria were not met
and/or see below

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD - Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:			Matrix/Level/Unit:		
COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

^{*} If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).

^{*} If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were metX
Criteria were not met
and/or see below

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

	LCS ID	COMPOUND	% R	QC LIMIT
Recoverie	s_within_labor	ratory_control_limits		
		<u> </u>		

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).

If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.

If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

		All criteria were metX Criteria were not met and/or see below
IX.	FIELD DUPLICATE PRECISION	
	Sample IDs:	Matrix:Soil

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information. Suggested criteria: RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
A1 5 115 1	<u> </u>			10 7 100 1	200
No field/laboratory duplicates analyzed for this data package. MS/MSD RPD used to assess precision. RPD within laboratory and generally acceptable control limits					
F	recision	. RPD within laborat	ory and generally accep	table cor	ntroi iimits
		1			

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were metN/A
Criteria were not met
and/or see below

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

- * Area of +100% or -50% of the IS area in the associated calibration standard.
- * Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE ACTION RANGE

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were metX
Criteria were not met
and/or see below

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JB30082-3R

Methanol

RF = 14.32

[] = (11023)/(14.32)

= 769.6 ppb OK

Note: JB30082-3R for Methanol: More than 40 % RPD for detected concentrations between the two GC columns.

JB30082-1R for Methanol: More than 40 % RPD for detected concentrations between the

two GC columns

Results for Methanol qualified.

All criteria were met _X
Criteria were not met
and/or see below

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION
	-	
	+	

Percent Solids		
List samples which	have ≤ 50 % solids	

Actions:

B.

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R) $\,$

	Project Number:	
	Date:	_03/01/2013
REVIEW OF VOLATILE ORGA The following guidelines for evaluating volatile organics we	ere created to delinea	
actions. This document will assist the reviewer in using pro- decision and in better serving the needs of the data users. The USEPA data validation guidance documents in the following of	e sample results were a order of precedence: U	assessed according to SEPA Region 2, SOP
HW-24, Standard Operating Procedure for the Validation of C 8260B (August, 2009-Revision 2), the USEPA National Concentration Organic Data Review (SOW SOM01.2 SOP HV	al Functional Guidelin V-33, August 2009 – Re	es for Low/Medium evision 2), the USEPA
National Functional Guidelines for Organic Data Review for Lo 2009-Revision 3). Also, QC criteria from "Test Methods for Methods SW-846 (Final Update III, December 1996)," specifical	Evaluating Solid Was ally for Methods 8000/8	te, Physical/Chemical 260B are utilized. The
QC criteria and data validation actions listed on the data revied document, unless otherwise noted.	w worksheets are from	the primary guidance
The hardcopied (laboratory name) _Accutest_ reviewed and the quality control and performance data summa	data packag rized. The data review f	e received has been or VOCs included:
Lab. Project/SDG No.:JB30252 No. of Samples:1	Sample matrix:	_Soil
No. of Gampies.		
Trip blank No.:		
Field blank No.:		
Equipment blank No.:		
Field duplicate No.:		
X Data Completeness	X Laboratory	Control Spikes
X Holding Times	X Field Duplic	•
X GC/MS Tuning	X Calibrations	
X Internal Standard Performance	X Compound	Identifications
X Blanks	X Compound	
X Surrogate Recoveries	X Quantitatio	n Limits
X Matrix Spike/Matrix Spike Duplicate		
Overall Comments:_Selected_VOC's_by_SW846-8260B_		
Definition of Qualifiers:	-	
J- Estimated results		
U- Compound not detected		
R- Rejected data 🔨		
UJ- Estimeted nondetect		
Reviewer: Kurwowiw		
Date:04/14/20\3/		

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were metX
Criteria were not met
and/or see below

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pН	ACTION	
			_		
	Sample analyzed w	ithin method recomme	nded hold	ing time.	
	- Campio analyzod w		1.000		

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH \leq 2, 4°C), no air bubbles.

Aqueous samples -7 days from sample collection for unpreserved samples, 4°C , no air bubbles.

Soil samples- 7 days from sample collection.

Cooler temperature (Criteria: 4 ± 2 °C): 3.5 °C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R). If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)

If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).

If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).

If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).

If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).

If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

		Cri	All criteria were metX teria were not met see below
GC/MS TUNING			
The assessment o standard tuning QC	_	o determine if the sample instru	mentation is within the
XThe BFB p	erformance results were	reviewed and found to be within	the specified criteria.
XBFB tuning	was performed for ever	y 12 hours of sample analysis.	
lf no, use profession	. •	nine whether the associated da	ta should be accepted,
List	the	samples	affected:
			

If mass calibration is in error, all associated data are rejected.

All criteria were metX
Criteria were not met
and/or see below

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:	_01/07/13
Dates of continuing calibration:	03/12/13
Instrument ID numbers:	GCMSY
Matrix/Level:Aqueous/low	

DATE	LAB ID#	FILE	CRITERIA OUT RFs, %RSD, <u>%D</u> , r	COMPOUND	SAMPLES AFFECTED
				_	
	Init	ial and o	continuing calibration m	eet method specific re	quiremets

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.

All %RSD must be < 15 % regardless of method requirements for CCC.

All %Ds must be \leq 20% regardless of method requirements for CCC.

It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of \geq 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.

If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.

If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).

If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were metN/A
Criteria were not met
and/or see below

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE Analyzed	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
		method_specific	c_criteria	
Field <u>/</u> Equipmen	nt/Trip blank			
DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_field/equip	ment/trip_blank	s_analyzed_wi	th_this_data_package	

All criteria were metN/A
Criteria were not met
and/or see below

VB. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)

ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and \le AL, report the compound as not detected (U) at the SQL.

If the concentration is \geq SQL but \leq AL, report the compound as not detected (U) at the reported concentration.

If the concentration is \geq SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately

Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES
				<u> </u>	
			<u> </u>		

All criteria were metX
Criteria were not met
and/or see below

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.

Matrix: solid/aqueous

SAMPLE ID		SURROGATE COMPOUND			ACTION
1	I,2-DCA	DBFM	TOL-d8	BFB	
_All_surrogate_reco	veries_within	_laboratory_con	trol_limits_exce	pt_for_QC_samp	le:
_JB30950-2MS/-2MS	SD	47/50			No_action_
Note: no action; qc s	ample.				
QC Limits* (Aqueous	s)				
LL_to_UL	to	to	to	to	_
QC Limits* (Solid-Lo	•				
LL_to_UL_		70_to_1	30to	to	
QC Limits* (Solid-MeLL_to_UL	•	to	to	to	
1,2-DCA = 1,2-Dichk DBFM = Dibromofluc		d 4		s = Toluene-d8 Bromofluorobenz	ene

- QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 80 120 % for aqueous and 70 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%. If anyone surrogate in a fraction shows < 10 % recovery.

All criteria were metX	
Criteria were not met	
and/or see below	

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:JB	30950-2MS/-2MSD			Matrix/	Level:Soil
MS OR MSD _MS _MSD	COMPOUND Acetone	% R 291_ 268_	RPD	QC LIMITS 10198	ACTIONQualify_results

Note: Results for Acetone in JB30252-1 qualified as estimated (J).

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met _	X
Criteria were not met	
and/or see below	_

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD - Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:			Matrix/Le	vel/Unit:	
COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION
	 				

Actions:

^{*} If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).

^{*} If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were metX_	
Criteria were not met	
and/or see below	

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

	LCS ID	COMPOUND	% R	QC LIMIT	
Recoveri	Recoveries_within_laboratory_control_limits				

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).

If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? <u>Yes</u> or No. If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

		All criteria were metN/A Criteria were not met and/or see below
IX.	FIELD DUPLICATE PRECISION	
	Sample IDs:	Matrix:

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information. Suggested criteria: RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION	
No field/laboratory duplicate analyzed with this data package. MS/MSD recoveries RPD used to						
assess precision. RPD within laboratory control limits						

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were metX
Criteria were not met
and/or see below

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

- * Area of +100% or -50% of the IS area in the associated calibration standard.
- * Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE ACTION RANGE
_Internal_st	andard_area_within	_laboratory_cor	ntrol_limits	
Actions:				

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met _X
Criteria were not met
and/or see below

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JB30252-1

Acetone

RF = 0.032

[] = (2995)(50)/(137213)(0.032)

= 34.1 ppb OK

All criteria were metX
Criteria were not met
and/or see below

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION
	-	

В.	Percent Solids
	List samples which have ≤ 50 % solids

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R) $\,$

	Project Number:JB30252r
	Date:03/012013
REVIEW OF VOLATILE ORGATHE following guidelines for evaluating volatile organics was actions. This document will assist the reviewer in using predictions and in better serving the needs of the data users. The JSEPA data validation guidance documents in the following HW-24, Standard Operating Procedure for the Validation of 8260B (August, 2009-Revision 2), the USEPA Nation Concentration Organic Data Review (SOW SOM01.2 SOP Hill Validational Functional Guidelines for Organic Data Review for Low 2009-Revision 3). Also, QC criteria from "Test Methods for Methods SW-846 (Final Update III, December 1996)," specific QC criteria and data validation actions listed on the data revision unless otherwise noted.	ANIC PACKAGE vere created to delineate required validation refessional judgment to make more informed the sample results were assessed according to order of precedence: USEPA Region 2, SOP Organic Data Acquired using SW-846 Method al Functional Guidelines for Low/Medium W-33, August 2009 – Revision 2), the USEPA ow Concentration Water (SOP HW-13, August, or Evaluating Solid Waste, Physical/Chemical cally for Methods 8000/8015C are utilized. The new worksheets are from the primary guidance data package received has been
eviewed and the quality control and performance data summa	arized. The data review for VOCs included:
.ab. Project/SDG No.:JB30252r No. of Samples:1	
Frip blank No.: Field blank No.: Equipment blank No.: Field duplicate No.:	
X Data CompletenessX Holding TimesN/A_ GC/MS TuningN/A_ Internal Standard PerformanceX BlanksX Surrogate RecoveriesX Matrix Spike/Matrix Spike Duplicate	XLaboratory Control SpikesXField DuplicatesXCalibrationsXCompound IdentificationsXCompound QuantitationXQuantitation Limits
Overall Comments:_Selected_alcohols_(methanol_and_ _(DAI)	isopropyl_alcohol)_by_SW846-8015C_
Definition of Qualifiers: J- Estimated results J- Compound not detected R- Rejected data JJ- Estimated nondetect Reviewer: Date: 04/15/2013	

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met	
Criteria were not met	
and/or see belowX	

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pН	ACTION
JB30252r-1R	03/01/13	03/20/13	-	Estimate positive results
			-	(J) and nondetects (J)
			-	
			-	
			-	

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH \leq 2, 4°C), no air bubbles.

Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles. Soil samples- 7 days from sample collection.

Cooler temperature (Criteria: 4 ± 2 °C): 3.5 °C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).

If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)

If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).

If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).

If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).

If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).

If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

List

All criteria were metN/A Criteria were not met see below
GC/MS TUNING
The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits
N/A_ The BFB performance results were reviewed and found to be within the specified criteria.
N/A_ BFB tuning was performed for every 12 hours of sample analysis.
If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

affected:

samples

If mass calibration is in error, all associated data are rejected.

the

All criteria were metX
Criteria were not met
and/or see below

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:	_09/24/12					
Dates of continuing calibration:	_03/20/13					
Instrument ID numbers:	_GCGH					
Matrix/Level:Aqueous/medium						

DATE	LAB ID#	FILE	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED		
Initial and continuing calibration meets method specific requirements in at least one of the two signals.							

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.

All %RSD must be \leq 15 % regardless of method requirements for CCC.

All %Ds must be < 20% regardless of method requirements for CCC.

It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of > 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.

If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.

If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).

If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were metN/A
Criteria were not met
and/or see below

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
			fic_criteria	
Field <u>/</u> Equipment	·		COMPOUND	CONCENTRATION
ANALYZED		MATRIX		UNITS
_No_field/frip/ed	uipment_biank	(s_analyzed_wi	tn_tnis_data_package 	

All criteria were metN/A	
Criteria were not met	
and/or see below	

VB. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)

ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and \le AL, report the compound as not detected (U) at the SQL.

If the concentration is \geq SQL but \leq AL, report the compound as not detected (U) at the reported concentration.

If the concentration is > SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately

Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES
			_		
				¦——	
			<u> </u>	_	
		-			
		· —			
					_

All criteria were metX
Criteria were not met
and/or see below

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.

Matrix: solid/aqueous

SAMPLE ID	,	SURROGATE	COMPOUND		ACTION
Hexar					
_All_surrogate_recoveries	_and_reten	tion_times_with	nin_laboratory_	control_limits	
					_
QC Limits* (Aqueous)					
LL_to_UL	to	to	to	to	
QC Limits* (Solid-Low)					
LL_to_UL	to	to	to	to	-
QC Limits* (Solid-Med)					
LL_to_UL	to	to	to	to	
1,2-DCA = 1,2-Dichlorome				Toluene-d8 mofluorobenze	ne
* QC limits are labo	ratory in-ho	use performan	ce criteria, LL =	lower limit, UL =	= upper limit.

* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.

If any one surrogate in a fraction shows < 10 % recovery.

All criteria were metX
Criteria were not met
and/or see below

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:JB3	0082-2RMS/-2RMSD		Matrix/	Level:Soil	
MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
MS/MSD_recov	veries_and_RPD_with	in_labor	atory_co	ntrol_limits	

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were metX
Criteria were not met
and/or see below

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD - Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:			Matrix/Level/Unit:		
COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

^{*} If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).

 $^{^{\}star}$ If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met _X
Criteria were not met
and/or see below

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT
ries_within_labor	ratory_control_limits		
	-		
			LCS ID COMPOUND % R ries_within_laboratory_control_limits

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).

If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? <u>Yes</u> or No. If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

		All criteria were metX Criteria were not met and/or see below
IX.	FIELD DUPLICATE PRECISION	
	Sample IDs:	Matrix:Soil

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information. Suggested criteria: RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION	
			_			
	No field/laboratory duplicates analyzed for this data package. MS/MSD RPD used to assess					
p	recision	RPD within laborat	ory and generally accep	table con	trol limits	

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were metN/A
Criteria were not met
and/or see below

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

- * Area of +100% or -50% of the IS area in the associated calibration standard.
- * Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE ACTION RANGE
•				

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were metX
Criteria were not met
and/or see below

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JB30252r-1R

Methanol

RF = 14.32

[] = (18504)/(14.32)

= 1292 ppb OK

All criteria were metX
Criteria were not met
and/or see below

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION
		

B.	Percent Solids
	List samples which have ≤ 50 % solids

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ) If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)

		nber:JB3U345
	Date:	03/01/2013
DE 115111 OF 1101 ATH 5 OD 0.4	D.4.01/.4.	05
REVIEW OF VOLATILE ORGA		
The following guidelines for evaluating volatile organics was actions. This document will assist the reviewer in using projection and in better serving the needs of the data users. The JSEPA data validation guidance documents in the following of JW-24, Standard Operating Procedure for the Validation of Cl260B (August, 2009-Revision 2), the USEPA National Concentration Organic Data Review (SOW SOM01.2 SOP HV National Functional Guidelines for Organic Data Review for Lo2009-Revision 3). Also, QC criteria from "Test Methods for Methods SW-846 (Final Update III, December 1996)," specific QC criteria and data validation actions listed on the data reviewed and the quality control and performance data summature. The hardcopied (laboratory name) _Accutest	ofessional judge sample result order of prece Organic Data Ala Functional W-33, August ow Concentration Evaluating Stally for Methodew worksheets data arized. The data of the	gment to make more informed ults were assessed according to dence: USEPA Region 2, SOP Acquired using SW-846 Method Guidelines for Low/Medium 2009 – Revision 2), the USEPA ion Water (SOP HW-13, August, Solid Waste, Physical/Chemical ds 8000/8260B are utilized. The s are from the primary guidance a package received has been ta review for VOCs included:
lo. of Samples:1		
rip blank No.: Field blank No.: Equipment blank No.: Field duplicate No.: X Data CompletenessX Holding TimesX GC/MS TuningX Internal Standard PerformanceX Blanks	XLa XFi XCa XCa	aboratory Control Spikes eld Duplicates
X Surrogate Recoveries		uantitation Limits
X Matrix Spike/Matrix Spike Duplicate		
Overall Comments:_Selected_VOC's_by_SW846-8260B	<u> </u>	
Definition of Qualifiers: - Estimated results - Compound not detected R- Rejected data - JJ- Estimated nordetect - Reviewer:		_

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED
		<u> </u>

All criteria were metX
Criteria were not met
and/or see below

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	рН	ACTION
			_	
	Comple analyzed w	ithin method recomme	ndod boldi	ing time
	Sample analyzed w	ulin method recomme	liaea Holai	ing unie.

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH \leq 2, 4°C), no air bubbles.

Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles. Soil samples- 7 days from sample collection.

Cooler temperature (Criteria: 4 ± 2 °C): 2.5°C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R). If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ) If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).

If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).

If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).

If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).

If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

			All criteria were metX
		Criteria	were not met see below
GC/MS TUNING			
The assessment standard tuning C	<u> </u>	determine if the sample instrume	entation is within the
_XThe BFB	performance results were r	reviewed and found to be within the	e specified criteria.
XBFB tunir	ng was performed for every	12 hours of sample analysis.	
If no, use profess qualified or reject	, •	ine whether the associated data	should be accepted,
List	the .	samples	affected:

If mass calibration is in error, all associated data are rejected.

All criteria were met _X
Criteria were not met
and/or see belowX

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:	_02/20/13_	02/22/13_
Dates of continuing calibration:	_03/12/13_	03/12/13_
Instrument ID numbers:	_GCMSA_	_GCMSE
Matrix/Level:Aqueous/low		

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, <u>%D</u> , r	COMPOUND	SAMPLES AFFECTED
GCMSA				
03/12/13	cc7222-20	-20.7	Acetone	JB30345-1

Note: Result for acetone qualified as estimated (J) in affected sample.

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.

All %RSD must be < 15 % regardless of method requirements for CCC.

All %Ds must be < 20% regardless of method requirements for CCC.

It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of \geq 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.

If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.

If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).

If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were metN/A
Criteria were not met
and/or see below

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL <i>i</i> Matrix	COMPOUND	CONCENTRATION UNITS
All_method	J_blank_meet_r	method_specifi	c_criteria	
Field/Equipment	-			
DATE ANALYZED	LAB ID	LEVEL! Matrix	COMPOUND	CONCENTRATION UNITS
_No_field/equip	ment/trip_blank	s_analyzed_wi	th_this_data_package	

All criteria were metN/A
Criteria were not met
and/or see below

VB. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)

ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and \le AL, report the compound as not detected (U) at the SQL.

If the concentration is \geq SQL but \leq AL, report the compound as not detected (U) at the reported concentration.

If the concentration is > SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately

Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES
		_		<u> </u>	
				-	

All criteria were metX
Criteria were not met
and/or see below

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.

Matrix: solid/aqueous

SAMPLE ID		SURROGATE COMPOUND			ACTION	
1	,2-DCA	DBFM	TOL-d8	BFB		
_All_surrogate_recov	veries_within_	_laboratory_contro	ol_limits			
Note: no action; qc s	ample.					
QC Limits* (Aqueous	3)					
LL_to_UL	to	to	to	to		
QC Limits* (Solid-Lov	,	70 to 400	0 4-	4		
LL_to_UL QC Limits* (Solid-Me			Uto	to		
LL_to_UL_	,	to	to	to		
1,2-DCA = 1,2-Dichle		4		Toluene-d8		
DBFM = Dibromofluo	romethane		BFB = Bro	omofluorobenzen	е	

- QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 80 120 % for aqueous and 70 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%. If anyone surrogate in a fraction shows < 10 % recovery.

All criteria were metX
Criteria were not met
and/or see below

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:JB30917-2MS/-2MSD				Matrix/	Level:Soil	
MS OR MSD COMPOUND % R RPD QC LIMITS ACTION						
_MS/MSD_recoveries_and_RPD_within_laboratory_control_limits						

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were metX
Criteria were not met
and/or see below

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD - Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:			Matrix/Level/Unit:		
COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

^{*} If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).

^{*} If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met _X_	
Criteria were not met	
and/or see below	

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

	LCS ID	COMPOUND	% R	QC LIMIT			
Recoveri	Recoveries_within_laboratory_control_limits						

- QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).

If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? <u>Yes</u> or No. If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

		All criteria were metN/A Criteria were not met and/or see below
IX.	FIELD DUPLICATE PRECISION	
	Sample IDs:	Matrix:

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information. Suggested criteria: RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION		
No field/labor	No field/laboratory duplicate analyzed with this data package. MS/MSD recoveries RPD used to						
assess precision. RPD within laboratory control limits							
	_						

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were metX	
Criteria were not met	
and/or see below	

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

- * Area of +100% or -50% of the IS area in the associated calibration standard.
- * Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE ACTION RANGE
_Internal_st	tandard_area_within	_laboratory_cor	ntrol_limits	
		_		
				-
Actions:				

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 %	IS AREA > + 100%
		TO – 50%	
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were metX	
Criteria were not met	
and/or see below	

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JB30345-1

Acetone

RF = 0.082

[] = (17560)(50)/(189870)(0.082)

= 56.37 ppb OK

All criteria were met _X
Criteria were not met
and/or see below

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION
		
		-

В.	Percent Solids		
	List samples which have	≤ 50 % solids	

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R) $\,$

	Project Number:JB30345r Date:03/02/2013
REVIEW OF VOLATILE ORGATHE following guidelines for evaluating volatile organics was actions. This document will assist the reviewer in using projection and in better serving the needs of the data users. The JSEPA data validation guidance documents in the following HW-24, Standard Operating Procedure for the Validation of B260B (August, 2009-Revision 2), the USEPA Nation Concentration Organic Data Review (SOW SOM01.2 SOP Halational Functional Guidelines for Organic Data Review for Legonop-Revision 3). Also, QC criteria from "Test Methods for Methods SW-846 (Final Update III, December 1996)," specific QC criteria and data validation actions listed on the data revision tuniess otherwise noted. The hardcopied (laboratory name) _Accutesteviewed and the quality control and performance data summatical control and performance data summatical control and performance data summatical control and performance data summatical control and performance data summatical control and performance data summatical control and performance data summatical control and performance data summatical control and performance data summatical control and performance data summatical control and performance data summatical control and performance data summatical control and performance data summatical control and performance data summatical control and performance data summatical control control and performance data summatical control control and performance data summatical control con	vere created to delineate required validation of the sample results were assessed according to order of precedence: USEPA Region 2, SOF Organic Data Acquired using SW-846 Methodial Functional Guidelines for Low/Medium W-33, August 2009 – Revision 2), the USEPA ow Concentration Water (SOP HW-13, August or Evaluating Solid Waste, Physical/Chemica cally for Methods 8000/8015C are utilized. The new worksheets are from the primary guidance data package received has been
.ab. Project/SDG No.:JB30345r No. of Samples:1	Sample matrix:Soil
rip blank No.: Field blank No.: Equipment blank No.: Field duplicate No.:	
X Data CompletenessX Holding TimesN/A_ GC/MS TuningN/A_ Internal Standard PerformanceX BlanksX Surrogate RecoveriesX Matrix Spike/Matrix Spike Duplicate Overall Comments:_Selected_alcohols_(methanol_and_(DAI)	XLaboratory Control SpikesXField DuplicatesXCalibrationsXCompound IdentificationsXCompound QuantitationXQuantitation Limits isopropyl_alcohol)_by_SW846-8015C
Definition of Qualifiers: - Estimated results J- Compound not detected R- Rejected data JJ- Estimated nondetect Reviewer: Date: 04/15/2013	

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED
	·	
· · · · · · · · · · · · · · · · · · ·		

All criteria were met			
Criteria were not met			
and/or see belowX			

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	рН	ACTION
JB30345r-1R	03/02/13	03/20/13	_	Estimate positive results
			-	(J) and nondetects (J)
			_	

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH \leq 2, 4°C), no air bubbles.

Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles. Soil samples- 7 days from sample collection.

Cooler temperature (Criteria: 4 + 2 °C): 3.5°C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).

If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)

If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).

If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).

If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).

If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).

If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were metN/A Criteria were not met see below
GC/MS TUNING
The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits
N/A_ The BFB performance results were reviewed and found to be within the specified criteria.
N/A_ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected:

If mass calibration is in error, all associated data are rejected.

All criteria were metX
Criteria were not met
and/or see below

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:	_09/24/12
Dates of continuing calibration:_	03/20/13
Instrument ID numbers:	_GCGH
Matrix/Level:Aqueous/mediur	n

DATE	LAB	FILE	CRITERIA OUT	COMPOUND	SAMPLES	
	ID#		RFs, %RSD, %D, r		AFFECTED	
Initial and	Initial and continuing calibration meets method specific requirements in at least one of the two					
			signal	S		

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.

All %RSD must be < 15 % regardless of method requirements for CCC.

All %Ds must be < 20% regardless of method requirements for CCC.

It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of > 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.

If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.

If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).

If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were metN/A
Criteria were not met
and/or see below

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL! MATRIX	COMPOUND	CONCENTRATION UNITS
All_method				
Field/Equipmen				
DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_field/trip/ed	quipment_blank	s_analyzed_wi	th_this_data_package	

All criteria were metN/A
Criteria were not met
and/or see below

VB. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)

ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and \le AL, report the compound as not detected (U) at the SQL.

If the concentration is \geq SQL but \leq AL, report the compound as not detected (U) at the reported concentration.

If the concentration is \geq SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately

Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES
			 		

All criteria were metX_	
Criteria were not met	
and/or see below	

4 07701

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.

Matrix: solid/aqueous

SAMPLE ID Hexar	_	BURRUGATE	COMPOUND		ACTION
_All_surrogate_recoveries	_and_retent	ion_times_wit	hin_laboratory_	control_limits	
QC Limits* (Aqueous)					
LL_to_UL QC Limits* (Solid-Low)	to	to	to	to	
LL_to_UL QC Limits* (Solid-Med)	to	to	to	to	
LL_to_UL	to	to	to	to	
1,2-DCA = 1,2-Dichlorome				Toluene-d8 omofluorobenzer	e
* OO limita ana laha			aa aultaula II	January Brook III	

- QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 80 120 % for aqueous and 70 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.

If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met	_X
Criteria were not met	
and/or see below	

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs. RPD of the compounds which do not meet the criteria.

Sample ID:JB30082-2RMS/-2RMSD			Matrix/Level:Soil				
MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION		
MS/MSD_recoveries_and_RPD_within_laboratory_control_limits							

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

^{*} QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.

^{*} If QC limits are not available, use limits of 70 – 130 %.

All criteria were metX
Criteria were not met
and/or see below

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD - Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:			Matrix/Le	vel/Unit:	
COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

^{*} If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).

^{*} If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were metX
Criteria were not met
and/or see below

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

	LCS ID	COMPOUND	% R	QC LIMIT			
Recoveries_within_laboratory_control_limits							

- QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).

If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? <u>Yes</u> or No. If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

		All criteria were metX Criteria were not met and/or see below
IX.	FIELD DUPLICATE PRECISION	
	Sample IDs:	Matrix:Soil

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information. Suggested criteria: RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION	
	_				_	
	No field/laboratory duplicates analyzed for this data package. MS/MSD RPD used to assess					
p	recision	RPD within laborat	ory and generally accep	table con	trol limits	

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were metN/A
Criteria were not met
and/or see below

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

- * Area of +100% or -50% of the IS area in the associated calibration standard.
- * Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE ACTION RANGE	NC
···					
_					
		•			

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were metX
Criteria were not met
and/or see below

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JB30345-1R

Hexanol

RF = 106.5

[] = (379126)/(106.5)

= 3560 ppb OK

All criteria were metX
Criteria were not met
and/or see below

XII.	QUA	NTI	ΓΑΤΙ	ON	I IMAIT	ΓS
/III.	QU/	1411	$I \cap I \cap I$	\mathbf{v}		··

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION
		-
		_

В.	Percent Solids		
	List samples which have ≤ 50 % solid	s	

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ) If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)